November 15, 1941

Dr. Warren Weaver
The Rockefeller Foundation
49 West 49th Street
New York, New York

Dear Warren:

I am happy to report that our immunochemical work is going along extremely well. My collaborators are Dr. Dan Campbell and Dr. David Pressman, and two or three young Institute boys. We have completed an extensive quantitative study of precipitates formed by simple substances with two or more haptenic groups and the suitable antisera. These studies leave little doubt about the correctness of the framework theory and also show definitely that antibodies as a rule have a valence of 2, as I assumed originally without great direct experimental justification.

The most important development is, however, our continued success in manufacturing antisera in the laboratory by the denaturation-renaturation technique mentioned briefly near the end of my first paper. Dr. Campbell has improved the method of manufacture in the following way. A solution of normal gamma-globulin is taken, and as antigen the dye made by hooking two atoxyl groups to resorcinol, is added. This is then kept at 56° for a week. At this temperature the globulin chains unfold and refold in the presence of the antigen to form antibody. The haptene, arsanilic acid, is then added, and the solution is dialyzed against arsanilic acid solution until the original antigen has been got rid of. The antibody-arsanilic acid solution is then dialyzed against saline to get rid of the arsanilic acid. The resulting protein solution has all of the properties of an antiserum homologous to atoxyl groups. I think that this synthesis of antibodies in vitro can be considered to be pretty important.

My collaborator Dr. David Pressman would like to have some additional experience away from Pasadena, and I want to recommend him for appointment as a Rockefeller Fellow. Dr. Pressman received his Ph.D. at this Institute in organic chemistry a year and a half ago. His doctorate work was done with Professor Lucas in the field of physical-organic chemistry. He was then appointed Research Fellow, and for a year and a half has been working on immunochemical problems with Dan Campbell and me. He is a very good organic chemist. He is, I think, about as able a man as has been graduated in organic chemistry here, although there have been some smarter physical chemists. His interest in immunology has become great, and he is looking forward to the possibility of a career in the border-line field between chemistry and immunology. The plan that he has in mind is to spend about ten months in the East, working for perhaps four or five months with Landsteiner and for a similar period with Heidelberger, and perhaps taking a few weeks also to visit laboratories elsewhere. The project that he has in mind while with Landsteiner is one on which we have been collaborating with Landsteiner for some time, involving the study of azoprotein antigens made with a haptens which involves two different active groups.

At the end of this fellowship period Dr. Pressman would return here to continue work on our immunochemistry project.

Is there any possibility that Pressman could be given a fellowship? I think that it would be well worth while from our standpoint and that he is sufficiently able to justify the award.

I hope that you are not working too hard on your defense problems, and hope also that I shall be able to see you before long.

With best regards, I am

Sincerely yours,

Linus Pauling

LP:jr